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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,963	02/17/2004	Frank Holler	3081.55US01	9112
24113	7590	03/15/2005	EXAMINER	
PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/779,963	Applicant(s) HOLLER, FRANK	
	Examiner Audrey Y. Chang	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/17/2004</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 1-20 are objected to because of the following informalities:

(1). Claims 1-20 are *incomplete* for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between the *superimposing unit* and the *image generating device*. It is not clear **what** is being superimposed here by the “superimposing unit”. The generated image seems to be “superimposed” on the object by the focusing lens not by the “superimposing unit, (please see Figures 1-2 and the specification). It is therefore not clear what is being superimposed here by the “superimposing unit” and it is not clear the essential structural and logical relationships between the superimposing unit with the image generating device to make the scopes of the claims clear.

(2). The phrase “the measurement module” recited in claim 9 is confusing and indefinite since it lacks a proper antecedent basis from its based claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2872

3. Claims 1-9 and 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ferguson (PN. 6,379,009) in view of the patent issued to Piosenka et al (PN. 5,359,444).

Ferguson teaches a conjugate optics *projection display* that is comprised of an *image projector* (16, Figures 1 and 2) for generating an image in an image plane and a *beam splitter* (12) serves as the *superimposing unit* such that the *projected image* via conjugate optics will be *superimposed* on a real, actual *object* (11) at an *object plane* and the superimposed image will be viewed by an observer (10), wherein the image projector and the superimposing unit are *mounted* on a *head wearable support unit*, (please see Figures 1-2, the abstract and columns 3-4).

Ferguson teaches that the projected image is intended to be superimposed with the actual and real object in order to enhanced the viewing of the actual object, this implicitly means that the image plane and the object plane *coincide* with each other and it is implicitly true that an image projector implicitly comprises a *focusing unit* for forming the image at the image plane. However this reference does not teach explicitly that the focusing unit comprises a lens having variable refractive index and a control unit for adjusting the refractive index therefore controls the focus of the lens.

Piosenka et al in the same field of endeavor teaches an *auto-focusing optical apparatus* that includes a *lens* containing *liquid crystal material* with *variable refractive index* wherein the refractive index is controlled by the amount of voltage or electrical filed applied (with respect to *claims 4-6 and 14-16*) and the focus of the lens via the change of the refractive index is adjusted according to the measured distance between the support of the lens and the object plane and the distance between the observer's eyes and the support for the lens, (please see Figure 11 and the abstract). Piosenka et al further teaches, (*with respect to claims 2-3, 8-9, 12-13 and 18-19*), that a *measurement module* is included to measure the distances mentioned above and the measurement module includes a *lens control* for controlling the focus of the liquid crystal lens, (please see Figure 12). It would then have been obvious to one skilled in the art

Art Unit: 2872

to apply the teachings of Piosenka et al to replace the focusing unit in the image projector of the Ferguson to make the focusing lens an *auto-focusing lens* to ensure the image generated from the image projector is *always properly* focused and superimposed on the real actual object since the projection display disclosed by Ferguson is a head mount display wherein by the motion of the observer the projected image will easily be off-focused from the actual real object and lose the purpose of superimposing the projected image with the real actual object.

With regard to claims 7 and 17, Ferguson teaches that the superimposing unit comprises a beam splitter that includes a splitter mirror, (12).

4. Claims 1, 4-7, 10, 11, 14-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ferguson (PN. 6,379,009) in view of the patent issued to Baba et al (PN. 4,802,746).

Ferguson teaches a conjugate optics *projection display* that is comprised of an *image projector* (16, Figures 1 and 2) for generating an image in an image plane and a *beam splitter* (12) serves as the *superimposing unit* such that the *projected image* via conjugate optics will be *superimposed* on a real, actual *object* (11) at an *object plane* and the superimposed image will be viewed by an observer (10), wherein the image projector and the superimposing unit are *mounted on a head wearable support unit*, (please see Figures 1-2, the abstract and columns 3-4).

Ferguson teaches that the projected image is intended to be superimposed with the actual and real object in order to enhanced the viewing of the actual object, this implicitly means that the image plane and the object plane *coincide* with each other and it is implicitly true that an image projector comprises *focusing unit* for forming the image at the image plane. However this reference does not teach explicitly that the focusing unit comprises a lens having variable refractive index and a control unit for adjusting the refractive index therefore controls the focus of the lens.

Baba et al in the same field of endeavor teaches a *variable focus optical element* wherein the variable focus optical element utilizes a *liquid crystal material* with *variable refractive index* such that the refractive power of the lens is adjustable via and in response to a *focus detecting device*, (please see Figures 9-10, column 2, lines 3-38 and column 13, lines 64-69). With regard to claims 4-6, and 14-16, **Baba et al** teaches that the variable focus optical element utilizes liquid crystal material, which is an electro-optical material, such that the refractive index of the liquid crystal is varied or adjusted in response electrical field applied, (please see column 13, line 64 to column 14, line 2). With regard to claims 10 and 20, **Baba et al** further teaches that the focus detecting device comprises a *measurement module* including *an image sensor* (39, Figures 9-13), which detects the image light from the object via the variable focus optical element (32) and a sharpness detecting circuit (42), such that based on the sharpness of the image detected a control signal is send to control the refractive power and therefore the focus of the variable focus optical element. This variable focusing optical element and the focus-detecting unit therefore together serves as the auto-focus unit, (please see column 9, line 36 to column 10, line 14 of **Baba et al**). It would then have been obvious to one skilled in the art to apply the teachings of **Baba et al** to replace the focusing unit in the projector of the **Ferguson** to make the focusing lens a focus variable lens with a focusing detecting device to *ensure* the image generated from the image projector is *always properly* focused and superimposed on the real actual object since the projection display disclosed by **Ferguson** is a head mount display wherein by the motion of the observer the projected image will easily be off-focused from the actual real object and lose the purpose of superimposing the projected image with the real actual object.

With regard to claims 7 and 17, **Ferguson** teaches that the superimposing unit comprises a beam splitter that includes a splitter mirror, (12).

Art Unit: 2872

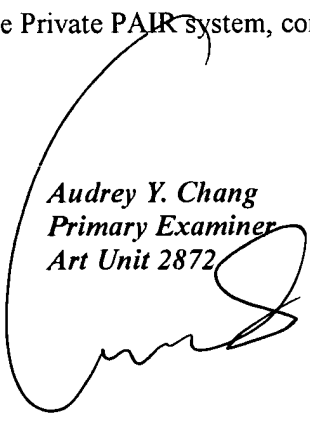
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Audrey Y. Chang
Primary Examiner
Art Unit 2872*



A. Chang, Ph.D.